Volunteer Lake Assessment Program Individual Lake Reports

HARVEY LAKE, NORTHWOOD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,553	**Max. Depth (m):**	6.5	**Flushing Rate (yr^{-1}):**	2.7
Surface Area (Ac.):	105	**Mean Depth (m):**	3.1	**P Retention Coef:**	0.58
Shore Length (m):	3,900	**Volume (m^3):**	1,320,500	**Elevation (ft):**	613

TROPHIC CLASSIFICATION

Year	Trophic class
1990	EUTROPHIC
2006	EUTROPHIC

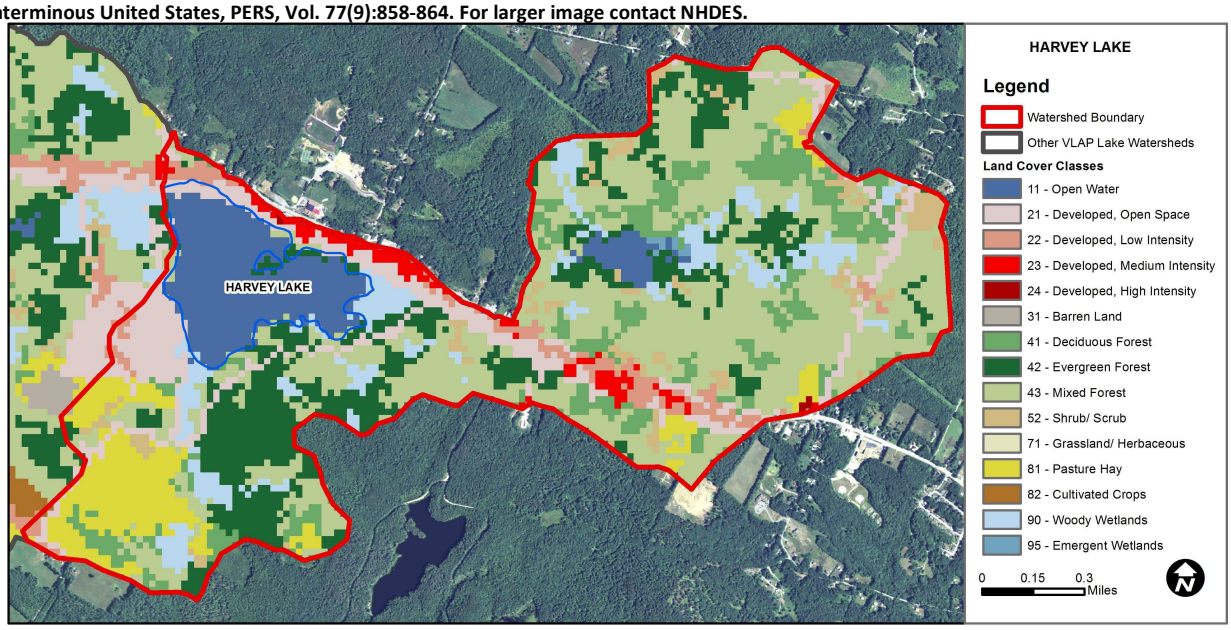
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	9.57	Barren Land	0.02	Grassland/Herbaceous	0
Developed-Open Space	9.11	Deciduous Forest	9.23	Pasture Hay	7.54
Developed-Low Intensity	3.06	Evergreen Forest	15.3	Cultivated Crops	0.03
Developed-Medium Intensity	1.78	Mixed Forest	34.03	Woody Wetlands	6.8
Developed-High Intensity	0.1	Shrub-Scrub	3.33	Emergent Wetlands	0.17

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
HARVEY LAKE, NORTHWOOD, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in July and August and greater than the state median; however average levels decreased from those measured in 2012. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride were slightly elevated and greater than the state medians. Historical trend analysis indicates relatively stable epilimnetic conductivity with moderate variability between years.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was slightly elevated and greater than the state median, however decreased slightly from 2012. Epilimnetic phosphorus was elevated in August and the turbidity was also elevated. Historical hypolimnetic dissolved oxygen levels have typically been depleted and can cause the release of phosphorus and other organic compounds from bottom sediments. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Inlet and Outlet phosphorus were slightly elevated in July, however average levels in 2012 were lower than normal. Tributary flows were higher than normal in 2013 due to significant storm events. The increased flow likely resulted in decreased phosphorus levels.
- **TRANSPARENCY:** Transparency was fairly good in July and decreased slightly in August. The 2013 average transparency was better than what has been measured since 2008. However, historical trend analysis indicates a significantly decreasing (worsening) lake transparency since monitoring began.
- **TURBIDITY:** Hypolimnetic turbidity was elevated in August likely due to the release of organic compounds from bottom sediments during anoxic conditions. Tributary turbidity was fairly average for the lake.
- **PH:** Deep spot and tributary pH were less than desirable and potentially critical for aquatic life. Historical trend analysis indicates highly variable epilimnetic pH between years.
- **RECOMMENDED ACTIONS:** The increased flow through the lake system from significant storm events likely helped to flush excess nutrients and resulted in slightly improved water quality in 2012. However, efforts should continually be made to reduce nutrient loading for watershed sources such as agricultural operations, septic systems, and fertilizers. With the increase in high volume, high intensity storm events, decreasing stormwater runoff into the lake should be a priority. Utilize DES' "Homeowner's Guide to Stormwater Management" as a resource for homeowners on reducing stormwater runoff from their properties. Keep up the great work!

Table 1. 2013 Average Water Quality Data for HARVEY LAKE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	6.50	8.22	21	92.5	16	1.98	2.08	1.26	6.51
Hypolimnion				91.6	29			4.77	5.96
Inlet 1			18	91.8	33			2.02	6.30
Outlet			20	95.6	24			1.35	6.17

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Stable	Trend not significant; data moderately variable.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.